

(Reaffirmed 2002)

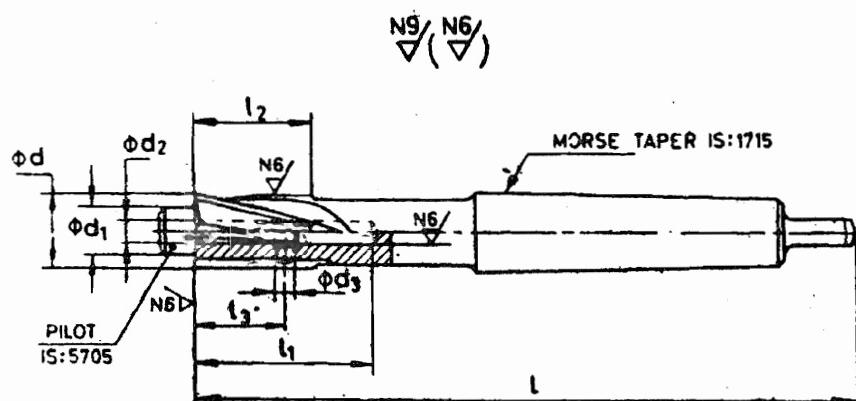
(Reaffirmed 2013)

*\* Indian Standard*  
**SPECIFICATION FOR  
 COUNTERBORES WITH MORSE TAPER SHANKS  
 AND DETACHABLE PILOTS**

*(First Revision)*

**1. Scope** — Covers the dimensions and requirements of counterbores with Morse taper shanks and detachable pilots, suitable for counterbores according to IS : 3406 (Part 2)-1986 'Dimensions for countersinks and counterbores: Part 2 Counterbores (second revision)'.

**2. Dimensions**



All dimensions in millimetres.

Cutting Diameter $d$ z9		Pilot Diameter $d_1$ e8		Dia $d_2$ H8	Set Screw Dia $d_3$ *	Bureau of Indian Standards Intranet Print Delhi / NEW DELHI	$l_2$	$l_3$	Morse Taper No.
Over	Up to and Including	Over	Up to and Including						
12.5*	16	5*	14	4	M3	132	30	22	16
16	20	6.3	18	5	M4	140	38	25	19
20	25	8	22.4	6	M5	150	46	30	23
25	31.5	10	28	8	M6	180	54	35	27
31.5	40	12.5	35.5	10	M8	190	64	40	32
40	50	16	45	12	M8	236	76	50	42
50	63	20	56	16	M10	250	88	63	53

Note — The figure is indicative of dimensions only and does not specify design features.

\*Diameters  $d = 12.5$  mm and  $d_1 = 5$  mm are also included.

Adopted 15 January 1988

© September 1989, BIS

Gr 2

BUREAU OF INDIAN STANDARDS  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

MAX. RETAIL PRICE  
ALL TAXES  
6130..

**3. Tolerances** — Tolerances on flute length, cutting length and overall length shall be as given below:

All dimensions in millimetres.

Length		Tolerances
Over	Up to and Including	
—	30	± 0.5
30	120	± 0.8
120	315	± 1.2

**4. Material** — Shall be as given in IS : 5099-1983 'Technical supply conditions for twist drills (*first revision*)'.

**5. Hardness** — Shall be as given in IS : 5099-1983.

**6. Designation** — A counterbore of Type H, fine series (f) having diameter  $d_1 = 20$  mm and pilot diameter  $d_2 = 14$  mm, conforming to this standard, and made of high speed steel shall be designated as:

Counterbore Hf 20 X 14 IS : 5710

**6.1** When the counterbore is required without a pilot, the pilot diameter  $d_2$ , shall be deleted from the designation.

**7. General Requirements**

**7.1** Flutes shall be three or more at the discretion of the manufacturer.

**7.2** The counterbores shall be right hand cutting with right hand helical flutes.

**7.3** Morse tapers shall be according to IS : 1715-1986 'Dimensions for self-holding tapers (*second revision*)'.

**7.4** Centre holes shall be according to IS : 2473-1975 'Dimensions for centre holes (*first revision*)'.

**7.5** Pilots shall be according to IS : 5705-1988 'Specification for detachable pilots for use with counterbores and countersinks 90° (*first revision*)'.

**7.6** Tool-type N shall be supplied according to IS : 5099-1983, unless otherwise specified.

**7.7** Slotted grub screws of Type A and material property Class 6.6 shall be according to IS : 2388-1971 'Specification for slotted grub screws (*first revision*)'.

**8. Marking** — Counterbores shall be marked with the designation, manufacturer's name or trade-mark, and month and year of manufacture.

**8.1 Standard Marking** — Details available with the Bureau of Indian Standards.

**9. Protective Coating and Packing**

**9.1** Each counterbore shall be covered with a suitable rust-proofing material and then wrapped in a non-absorbent paper.

**9.2** Each counterbore shall be protected by a cover bearing the designation and the manufacturer's name or trade-mark.

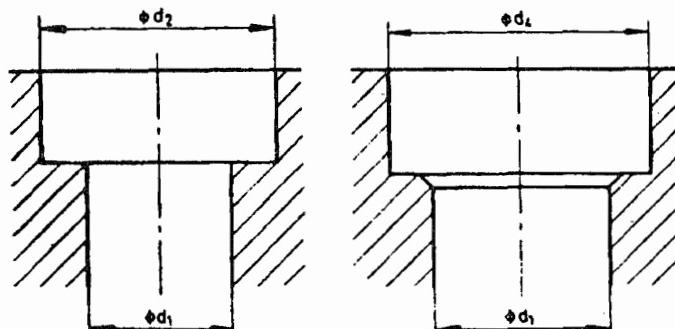
**10. Sampling** — The sampling and criteria of acceptance shall be in accordance with IS : 7778-1975 'Methods for sampling small tools'.

**11. Selection** — Selection of counterbore for counterbores Types H and K are given in Table 1.

TABLE 1 SELECTION OF COUNTERBORE DIAMETER

(Clause 11)

All dimensions in millimetres.



Counterbore Nominal Size $d \times d_1$	Application Counterbores as in IS : 3406 (Part 2)-1986		
	Designation	Dia $d_4$	Dia $d_2$
15 × 9.0	H m 8	15	—
15 × 8.4	H f 8	15	—
18 × 9.0	H1 K1 m 8	—	18
18 × 8.4	H1 K1 f 8	—	18
20 × 9.0	H2 K2 m 8	—	20
20 × 8.4	H2 K2 f 8	—	20
15 × 9.0	H3 K3 m 8	—	15
15 × 8.4	H3 K3 f 8	—	15
18 × 11.0	H m 10	18	—
18 × 10.5	H f 10	18	—
20 × 11.0	H1 K1 m 10	—	20
20 × 10.5	H1 K1 f 10	—	20
24 × 11.0	H2 K2 m 10	—	24
24 × 10.5	H2 K2 f 10	—	24
18 × 11.0	H3 K3 m 10	—	18
18 × 10.5	H3 K3 f 10	—	18
20 × 13.5	H m 12	20	—
20 × 13.0	H f 12	20	—
24 × 13.5	H1 K1 m 12	—	24
24 × 13.0	H1 K1 f 12	—	24
26 × 13.5	H2 K2 m 12	—	26
26 × 13.0	H2 K2 f 12	—	26
20 × 13.5	H3 K3 m 12	—	20

Counterbore Nominal Size $d \times d_1$	Application Counterbores as in IS : 3406 (Part 2)-1986		
	Designation	Dia $d_4$	Dia $d_2$
20 × 13.0	H3 K3 f 12	—	20
24 × 15.5	H m (14)	24	—
24 × 15.0	H f (14)	24	—
26 × 15.5	H1 K1 m (14)	—	26
26 × 15.0	H1 K1 f (14)	—	26
30 × 15.5	H2 K2 m (14)	—	30
30 × 15.0	H2 K2 f (14)	—	30
24 × 15.5	H3 K3 m (14)	—	24
24 × 15.0	H3 K3 f (14)	—	24
26 × 17.5	H m 16	26	—
26 × 17.0	H f 16	26	—
30 × 17.5	H1 K1 m 16	—	30
30 × 17.0	H1 K1 f 16	—	30
33 × 17.5	H2 K2 m 16	—	33
33 × 17.0	H2 K2 f 16	—	33
26 × 17.5	H3 K3 m 16	—	26
26 × 17.0	H3 K3 f 16	—	26
30 × 20.0	H m (18)	30	—
30 × 19.0	H f (18)	30	—
33 × 20.0	H1 K1 m (18)	—	33
33 × 19.0	H1 K1 f (18)	—	33
36 × 20.0	H2 K2 m (18)	—	36
36 × 19.0	H2 K2 f (18)	—	36

(Continued)

TABLE 1 SELECTION OF COUNTERBORE DIAMETER—*Contd*

Counterbore Nominal Size $d \times d_1$	Application Counterbores as in IS : 3406 (Part 2)-1986			Counterbore Nominal Size $d \times d_1$	Application Counterbores as in IS : 3406 (Part 2)-1986		
	Designation	Dia $d_4$	Dia $d_2$		Designation	Dia $d_4$	Dia $d_2$
30 × 20-0	H3 K3 m (18)	—	30	43 × 25-0	H1 K1 f 24	—	43
30 × 19-0	H3 K3 f (18)	—	30	46 × 26-0	H2 K2 m 24	—	46
33 × 22-0	H m 20	33	—	46 × 25-0	H2 K2 f 24	—	46
33 × 21-0	H f 20	33	—	40 × 26-0	H3 K3 m 24	—	40
36 × 22-0	H1 K1 m 20	—	36	40 × 25-0	H3 K3 f 24	—	40
36 × 21-0	H1 K1 f 20	—	36	43 × 30-0	H m (27)	43	—
40 × 22-0	H2 K2 m 20	—	40	46 × 30-0	H1 K1 m (27)	—	46
40 × 21-0	H2 K2 f 20	—	40	53 × 30-0	H2 K2 m (27)	—	53
33 × 22-0	H3 K3 m 20	—	33	43 × 30-0	H3 K3 m (27)	—	43
33 × 21-0	H3 K3 f 20	—	33	48 × 33-0	H m 30	48	—
36 × 24-0	H m (22)	36	—	53 × 33-0	H1 K1 m 30	—	53
36 × 23-0	H f (22)	36	—	61 × 33-0	H2 K2 m 30	—	61
40 × 24-0	H1 K1 m (22)	—	40	48 × 33-0	H3 K3 m 30	—	48
40 × 23-0	H1 K1 f (22)	—	40	53 × 36-0	H m (33)	53	—
43 × 24-0	H2 K2 m (22)	—	43	57 × 36-0	H1 K1 m (33)	—	57
43 × 23-0	H2 K2 f (22)	—	43	63 × 36-0	H2 K2 m (33)	—	63
36 × 24-0	H3 K3 m (22)	—	36	53 × 36-0	H3 K3 m (33)	—	53
36 × 23-0	H3 K3 f (22)	—	36	57 × 39-0	H m 36	57	—
40 × 26-0	H m 24	40	—	61 × 39-0	H1 K1 m 36	—	61
40 × 25-0	H f 24	40	—	57 × 39-0	H3 K3 m 36	—	57
43 × 26-0	H1 K1 m 24	—	43				

Note 1—Sizes shown within brackets are of second preference.

Note 2—Clearance hole dia  $d_1$  shall be according to medium and fine series as specified in IS : 1821-1987 Dimensions for clearance holes for bolts and screws (*third revision*)

#### EXPLANATORY NOTE

This standard was first published in 1970. In this revision:

- a) counterbore dimensions given in table are aligned with IS : 3406 (Part 2)-1986,
- b) reference to IS : 5099-1983 has been included for material and hardness,
- c) designation clause has been modified incorporating the type of counterbore and the thread pitch series,
- d) sampling clause has been included, and
- e) surface finish has been included.

In the preparation of this standard, considerable assistance has been derived from:

- a) ISO 4207-1977 'Counterbores with Morse taper shanks and detachable pilots', issued by the International Organization for Standardization (ISO), and
- b) DIN 375-1975 'Morse taper shank counterbores with detachable pilots', issued by the Deutsches Institut für Normung (DIN).

**AMENDMENT NO. 2 DECEMBER 2006**  
**TO**  
**IS 5705 : 1988 SPECIFICATION FOR DETACHABLE**  
**PILOTS FOR USE WITH COUNTERBORES AND**  
**COUNTERSINK 90°**

( *First Revision* )

[*Page 1, clause 4 (see also Amendment No. 1)*] — Delete 'Case hardened'.

(*Page 1, clause 8*) — Substitute 'IS 7778 ( Part 1 ) : 2003 Small tools sampling inspection procedures : Part 1 Twist drills, countersink and counterbores' for 'IS : 7778 – 1975' Methods for sampling small tools'.

( PG 10 )

**AMENDMENT NO. 1 MAY 1993**  
**TO**  
**IS 5705 : 1988 SPECIFICATION FOR DETACHABLE**  
**PILOTS FOR USE WITH COUNTERBORES AND**  
**COUNTERSINK 90°**  
*( First Revision )*

( *Page 1, clause 4* ) — Substitute the following for the existing clause:

**"4 Hardness** — Case hardened  
680 HV, Min  
750 HV, Max"

( *Page 1, clause 6.1* ) — Substitute the following for the existing clause:

**"6.1** The recess between the pilot and shank is left to the manufacturer's discretion."

( *Page 1, clause 6.2* ) — Delete.

( PED 10 )

---

Reprography Unit, BIS, New Delhi, India